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ABSTRACT

A study was done of factors affecting differences in teacher salaries among Vermont towns. Data from 181 local education agencies were used for the study and a set of factors was examined that included family, community, and school information to determine what influences teacher salaries. Findings included the following: (1) average teacher's salaries across districts range from a high of $43,958 to a low of $21,515; (2) five factors were associated with average teachers salary: average teachers education, ranked average daily membership, median income, cost per pupil, and average teachers experience (as these increase, teacher salary increases); (3) larger school districts generally have higher average teacher salaries and better educated and more experienced teachers; (4) lack of education opportunities for teachers in areas far from colleges with graduate education programs may adversely affect their salary scale, promotion, and general staff development; (5) several indirect factors are associated with average teachers salary: education level of parents, percent of children on food stamps, and child abuse rate. Overall teacher salaries were found to be not just a reflection of wealth in a community but also of the level of education in the community, the child abuse rate, and other socio-economic factors. (JB)

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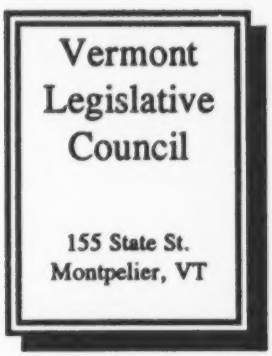
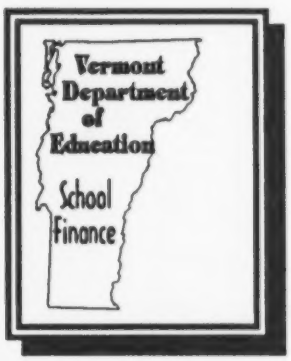
A Study of Factors Influencing Teacher Salaries In Vermont

Study conducted with cooperation between
the Vermont Department of Education
and
the Vermont Legislative Council

June 1993





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Executive Summary

•Average teachers salaries across districts range from a high of $43,958 to a low of $21,515.

•Five factors are associated with Average teachers salary -

1. average teachers education,
2. ranked average daily membership,
3. median income,
4. cost per pupil, and
5. average teachers experience.

•Larger school districts generally have

1. higher average teachers salaries, and
2. better educated and more experienced teachers.

•Lack of educational opportunities for teachers in areas far from colleges with graduate education programs may adversely affect their salary scale promotion, and general staff development.

•Several indirect factors are associated with Average teachers salary -

1. Education level of parents
2. Percent of children on food stamps
3. Child abuse rate

Overview

The question arises as to why similar towns pay teachers greatly different average teacher salaries. An examination of many economic, family and school factors was performed to determine which of these factors is associated with average teachers salary. The study included towns that operate schools and unified districts, and excludes union school districts as well as teachers in Supervisory Union offices, since much of the data are available by town.

An analysis was performed to indicate the direct and indirect factors associated with average teachers salary. The five factors which emerged include

- ★ Average teachers education,
- ★ Ranked average daily membership,
- ★ Cost per pupil,
- ★ Median family income of the town, and
- ★ Average teachers experience.

Teachers in this study have 4.9 years of post-secondary education and 9.6 years of teaching experience. Average teacher salary increases as each of these factors increases.

Several indirect factors are associated with with the average of teachers salary. These include:

- ★ Child abuse rate.
- ★ Rate of food stamp use among families with school aged children.
- ★ Average in the town of fathers education.

A more detailed discussion of how each of these factors interrelates is given. Graphs for each variable by county have been included. Simple Statistics and Correlations are also given to show the relationships that exist among the factors associated with Average teachers salary.

The teachers salaries are not just a reflection of wealth in a community. It is based on the level of education in the community (fathers and mothers education), the child abuse rate, and other socio-economic factors.

Discussion of Variation in Reported Means

Different sources report a wide variety in the reported average teachers salary. The average teachers salary reported by this study is lower than those reported by the National Education Association , American Federation of Teacher and Vermont School Boards Association.

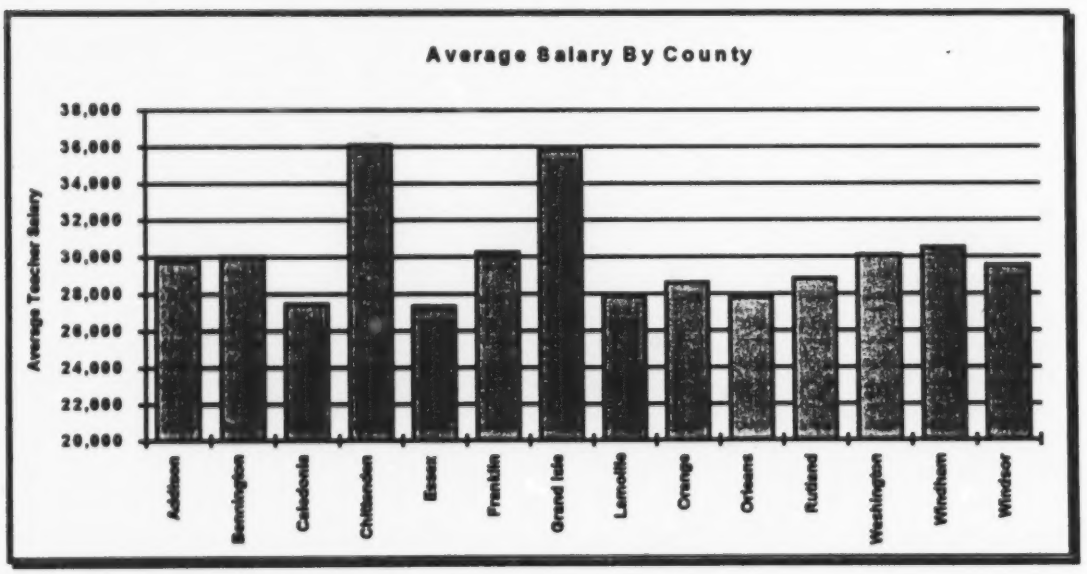
The mean supplied by the NEA (Rankings of the States, 1992) is an estimate from Vermont Department of Education FY92 Staffing Survey. This study mean is lower than the others in that it is not weighted by the number of teachers in a district. The average teachers salary of a small district carries the same weight as the average teachers salary in the largest district in the state. This helps remove the "big city" effect in calculating the average.

The VSBA Mean was computed by taking the total salary expenditure for all the reporting districts in the state and dividing by the total FTEs. The "big city" effect is not removed, and the high-paying towns pull this average up.

The AFTA mean is also higher, but they also reported the average teacher experience as 13.78, while this study calculates average teacher experience as 9.56.

Reported Average Teacher Salaries For FY92

Study Mean (181 LEA)	30,025
VSBA SU Districts Mean	30,231
VSBA Median	30,340
VSBA Unified Schools	32,532
VSBA Mean (251 LEA)	32,853
VSBA Town Schools Mean	33,136
AFTA "Estimated" Mean	33,200
NEA "Estimated" Mean	33,646



Technical Discussion

The average teacher salary by town varies widely in Vermont from a high of $43,958 in South Burlington to a low of $21,515 in Norton. This is a range or distance of $22,443.

One hundred and eighty-one Local Education Agencies or LEAs were used for this study. These are the town and unified districts that responded to Vermont School Boards survey.

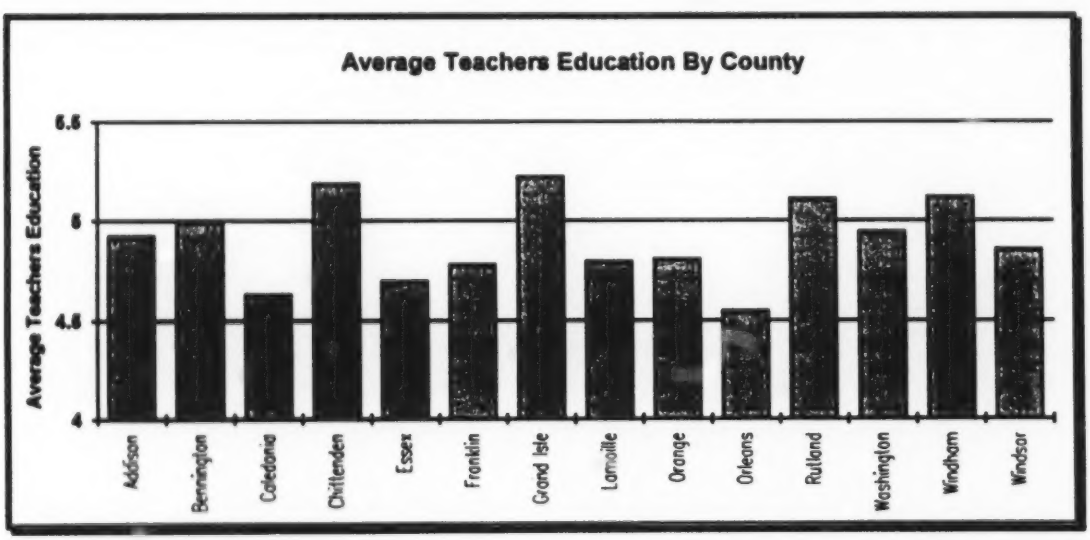
A set of factors was examined that included family, community, and school information to determine what influences teachers salaries. See the appendix for a complete list of the data sources. Lotus and SPSS software was used for the analysis.

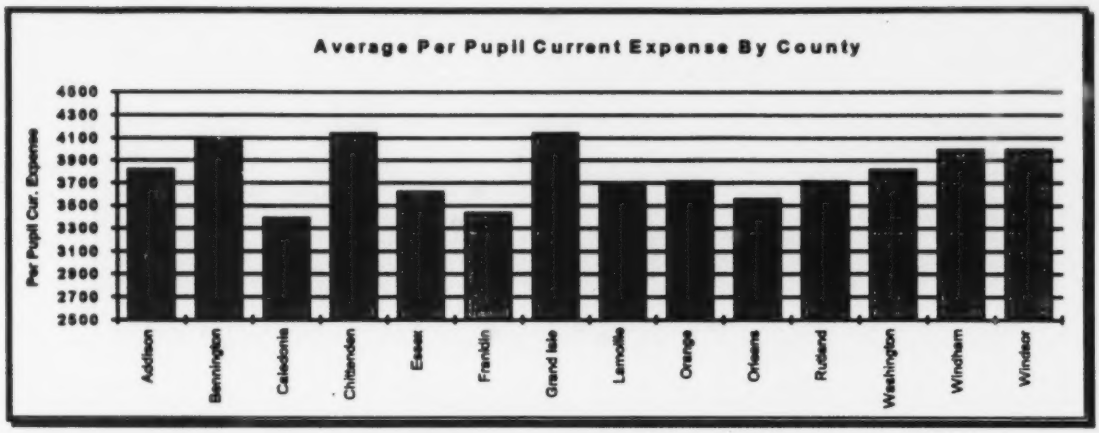
The full list of variables considered for the analysis is shown in Appendix A. A factor analysis of the data was performed to clarify the relationships between the data. Four factors emerged as the strongest factors influencing Average teachers salary. From the list of factors twelve variables emerged as the strongest variables, accounting for all the variation in the relationships between the variables. These twelve variables were then used to produce a regression model, with Average teachers salary as the dependent variable.

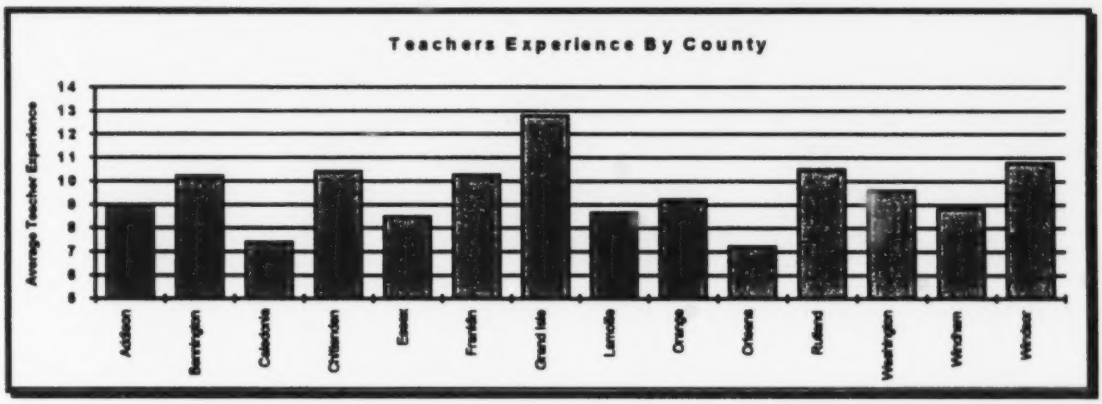
Five factors emerge as the strongest factors associated with the outcome, average teachers salary. They are

- average teachers education,
- ranked average daily membership,
- cost per pupil,
- median income and
- average teachers experience.

Since all five are positively linked to Average teachers salary, as each becomes larger, Average teachers salary will become larger.



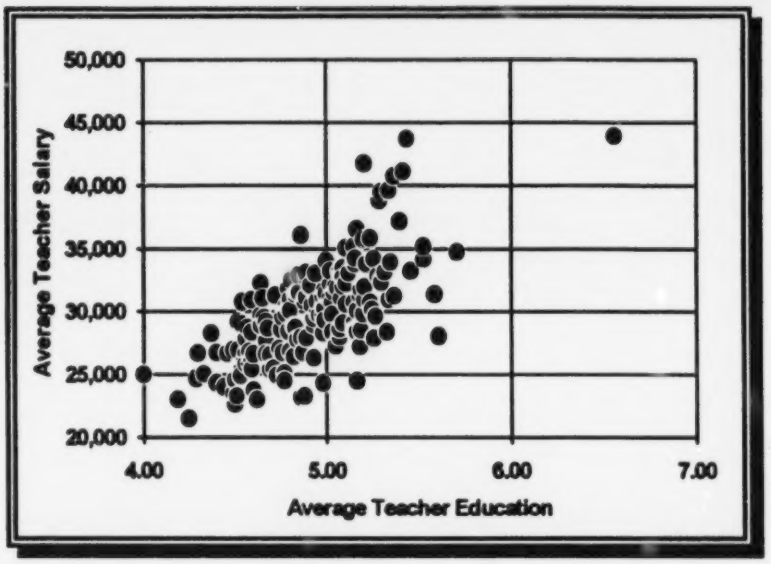


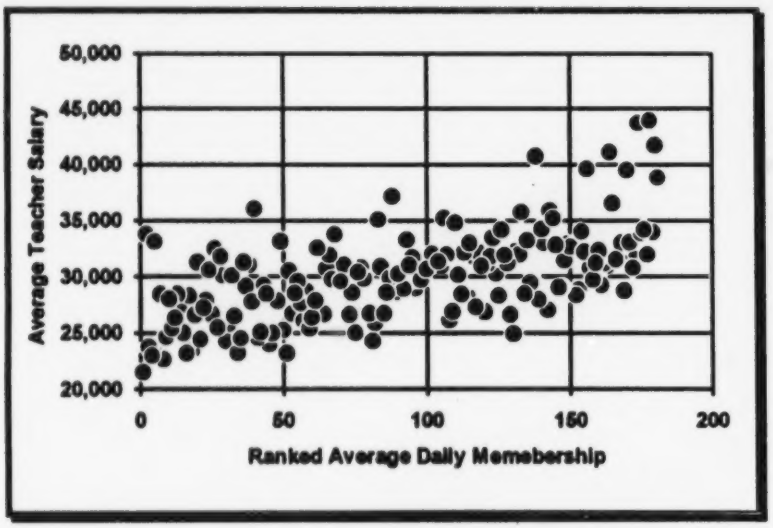


The relationships between average teachers salary and the other variables can be visualized by use of scatterplots. Scatterplots reveal many types of associations. Using average teachers salary as the variable on the Y or vertical axis and the associated factor on the X or horizontal axis, graphs were created to show the nature of the relationship between the factors. This gives a visual indication of the strength of the linear (straight-line) relationship between the factors. The more linear the relationship, the stronger the association between the factors. If the data is rising or getting higher on the plot from left to right, the relationship is considered to be positive. If the data are falling, the relationship is considered to be negative.

An additional measure of the strength of the linear relationship between the factors can be obtained by the use of the Pearsons Correlation Coefficient. The values of the coefficient range from -1 to +1, with a zero value indicating that no linear relationship exists between the factors. Positive values indicate that the data is rising, negative values that it is falling, as indicated in the plots. This is a unitless measure, meaning that it is unchanged by variable transformations. It is important to examine the scatterplots and the correlation coefficients simultaneously to verify the linearity of the relationships. Horizontal grids have been added to the plots to aid viewing the rise of the data.

When average teachers salary is plotted against average teachers education, the graph indicates a positive relationship. The Pearsons Correlation Coefficient is +.70 for this relationship. The data has a distinct rise from left to right. This indicates a very strong linear relationship.

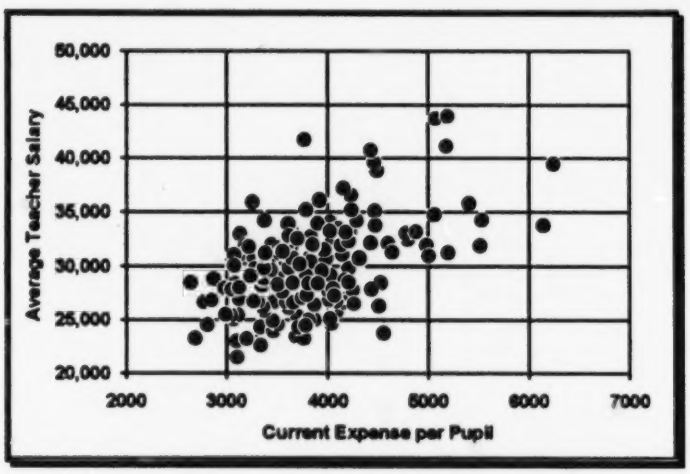




The second scatterplot is average teachers salary versus ranked average daily membership. The data indicates a more gradual rise than was indicated in the first plot. The Pearsons Correlation Coefficients is +.61. This relationship is not as strong as between average teachers salary and average teachers education, but is still a very strong relationship.

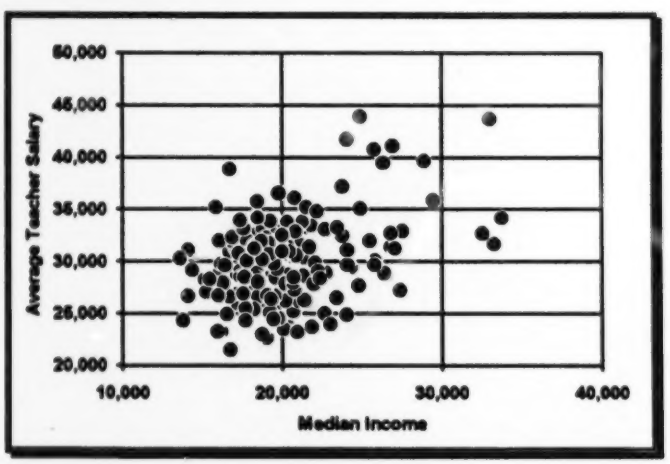
Note that high values for Pearsons Correlation Coefficient between two factors do not indicate a causal relationship. This is only an indication of the strength of the linear relationship. There is an association between the factors, but one factor does not necessarily cause the effect in the second factor.

In the third scatterplot, average teachers salary against average teachers experience. Again, the data rises from left to right. The Pearsons Correlation Coefficient is +.60. This is equally as strong as the relationship between average teachers salary and ranked average daily membership.



The fourth scatterplot is average teachers salary versus cost per pupil. The Pearsons Correlation Coefficient is +.50. This is a moderately strong linear relationship.

In the last scatterplot, average teachers salary is plotted versus median income. This is the weakest linear relationship, with a Pearsons Correlation Coefficient of +.39. This is not as strong a relationship as the previous four factors, but still a relationship to consider.



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Average Teachers Education And Average Teachers Experience

The factors, average teachers education and average teachers experience are both positively associated with average teachers salary. These factors connect directly to the type of teachers contract that a town has. All contracts in Vermont are arranged in a grid based on education and experience. The upper limits of education and experience vary from town to town. There are currently seventy-six salary grids in use in Vermont. These range from a simple salary grid with two education levels (Bachelors/Masters) to more complicated salary grids where between six and fifteen credits produce a level increase. Some Supervisory Unions have uniform salary grids in all member towns, while some Supervisory Unions have a different grid for each member town.

Teachers also have a statutory obligation to increase their level of education to retain their teaching certificate. "Applicants must have completed a total of nine credits hours of study or the equivalent in subject areas related to each endorsement." (Regulations Governing the Licensing of Educators and the Preparation of Educational Professionals - Effective July 1, 1989) After nine years of teaching, a teacher should have earned at least nine credits beyond their entry level degree.

Both average teachers education and average teachers experience are associated with the child abuse rate. The connection of these factors and the child abuse rate is negative. The child abuse rate is the rate of reported and founded cases of physical abuse, sexual abuse, and neglect. As the child abuse rate rises, the levels of teacher education and experience decline. Towns with high child abuse rates seem unable to retain experienced and educated teachers. As teachers gain both education and experience, they seem to be migrating to towns with lower child abuse rates.

The child abuse rate has a contributing factor, the misdemeanor rate. These are negatively related, as town size increases, the child abuse rate declines, but the misdemeanor rate rises. There is more crime reported in larger towns, but less reporting of child abuse.

Ranked Average Daily Membership

Ranked average daily membership is the second factor associated with Average teachers salary. Average daily membership is the average number of students per school district per day. Average daily membership was ranked or put in order from highest to lowest to remove the overpowering influences of a few large communities. Ranked average daily membership is highly related to the size of the town, the larger the town, the more students it has, the smaller the town, the less students it has.

The relationship between average teachers salaries and ranked average daily membership is positive. This means generally that teachers in Vermont receive higher salaries when they teach in school districts with larger populations.

Two factors are associated with ranked average daily membership. They are the child abuse rate and the food stamp rate for families with school aged children. The child abuse rate

is negatively related to the ranked average daily membership. This indicates that as the size of the town rises, the founded child abuse rate declines. A cursory interpretation would be that smaller towns have a higher child abuse rate. Child abuse is more likely to be reported in smaller town than in larger towns. Since the child abuse rate is also negatively connected to average teacher experience and average teacher education, this indicates that smaller towns have less experienced and less educated teachers.

The food stamp rate for families with school aged children is positively related to ranked average daily membership. The larger the town, the higher the food stamp rate.

Factors other than salary could be having an effect here. Less experienced teachers could feel more comfortable and more supported in smaller towns than in large towns. Many other reasons are also possible.

Median Income

Median income is the middle income of the ranked incomes of the town. It is considered to be a more reliable measure of "average" income, because it is less affected by very large and very small values. Median income is positively related to average teachers salary. Generally, as the median income of a town rises, the average teachers salary also rises.

Median Income has the associated factors of average fathers education and food stamp rate. As the median income rises, the food stamp rate declines and the average fathers income rises. As fathers become better educated, they have higher incomes and less families are dependent on food stamps.

Both the food stamp rate and average fathers education are associated with average mothers education. As average mothers education rises, average fathers education also rises and the food stamp rate declines. As families education level rises, median income rises and its level of prosperity increases (or its level of poverty decreases).

Cost Per Pupil

The average cost per pupil is calculated as the total school district expenditures minus special education costs, school transportation costs, and capital constructions costs (the cost of constructing buildings and the associated cost of borrowing the money to build schools). Teachers salaries make up the largest portion of total district expenditures after the removal of the above mentioned costs. The positive nature of the association between cost per pupil and average teachers salary is thus made clear.

Cost per pupil has the associated factor of average fathers education. This factor is also positively associated with median income. As average fathers education rises, Median income rises, and the amount spent to educate each student rises.

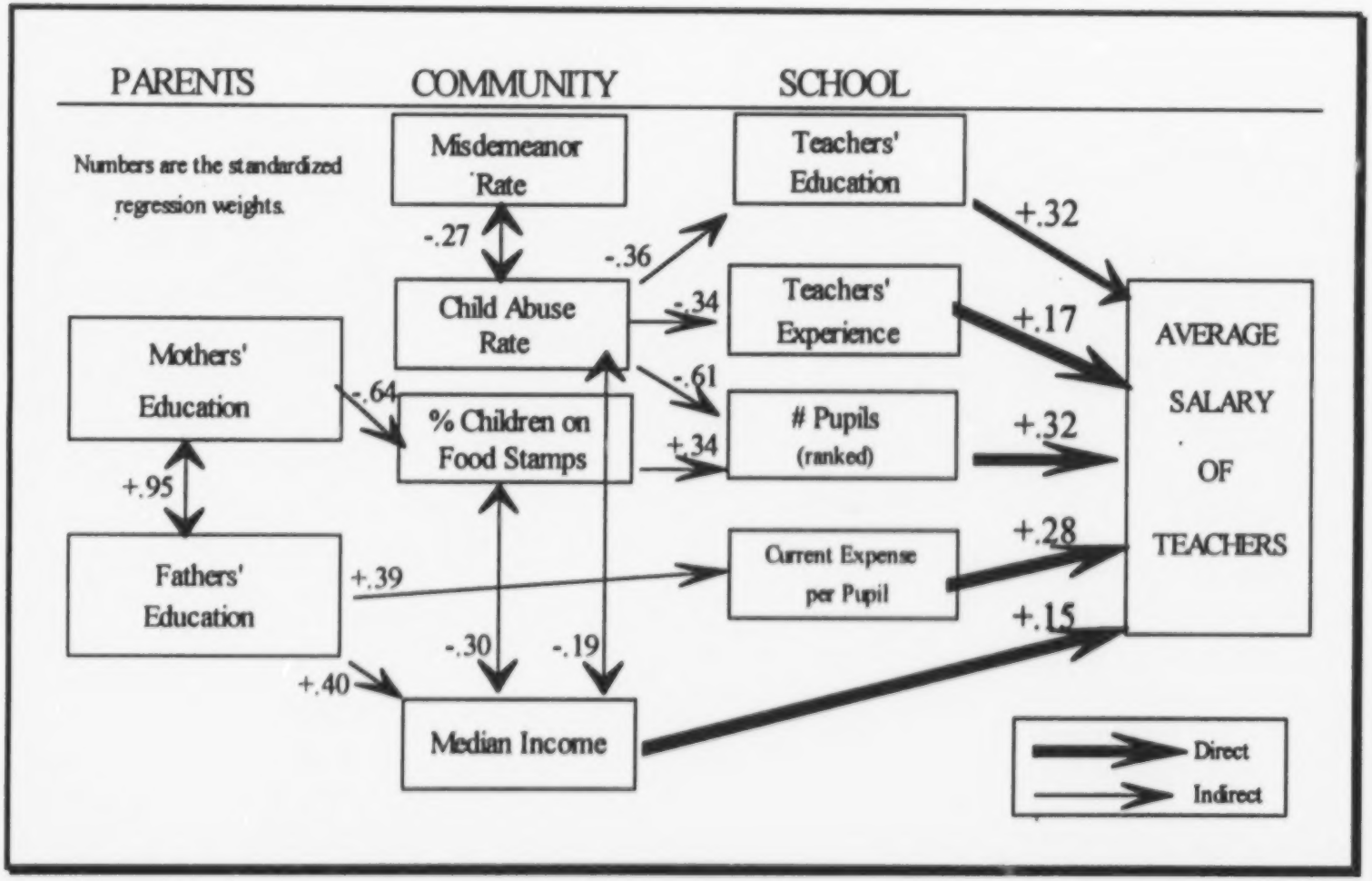
Conclusions

The factors that influence average teacher salaries in Vermont are complex and multifaceted. The size of salaries paid to teachers reflects the quality (education/experience) of the teacher, and also the kind of community and it values.

The list of factors investigated for this study is by no means the only factors that could be associated with average teachers salary. Other possible factors available but not included are fertility rate of mother, the average age at which they have their children, drug and alcohol abuse rates or ethnic background. These factors were not included because of the inadequacy of the data.

There also appears to be a migration of teachers after a few years of experience to the larger towns. In this migration salary may be the only issue. Several possible factors could be lack of advanced educational opportunities (colleges offering Master Degree programs in desirable fields), lack of teaching resources, unhappiness with a small town life style, the personality of a school with a high child abuse rate or a need of peer support. The inability of teachers living and teaching in areas remote from colleges and universities to obtain advanced degrees is a factor in the lower salaries present in these areas. If teachers cannot advance their education, they cannot advance their position or raise their salary.

The data studied indicates that the average teachers salary paid in Vermont is not just an indication of the economic wealth of the community, but also a reflection of the communities values and culture. It is also a reflection of how much value all people of the State of Vermont place in the concept of equity in educational resources.



Path Analysis Of Correlates With Average Teachers' Salary

Appendix A

Data in this study are from the

Vermont Department of Education,
Vermont Department of Health,
Vermont Department of Taxes,
Vermont Department of Social and Rehabilitation Services
Vermont Department of Correction,
Vermont Department of Employment and Training,
U.S. Department of Commerce - Bureau of the Census and
Vermont School Boards Association

<u>These include:</u>

1. 1992 residential property ownership ratio,
2. 1990 local tax burden,
3. 1990 population,
4. number of felons,
5. felony rate,
6. number of misdemeanors,
7. misdemeanor rate,
8. number of founded child abuse cases,
9. child abuse rate,
10. percent of mothers with education less than twelve years,
11. percent of fathers with education less than twelve years,
12. student teacher ratio,
13. number of full-time equivalents (number of teachers),
14. average years of mothers education,
15. average years of fathers education,
16. ranked average daily membership (number of pupils),
17. enrollment,
18. average teachers years of post-secondary education,
19. percentage of families with children receiving food stamps,
20. number of children (6-17) living below the poverty level,
21. percentage of children living below the poverty level,
22. average teachers experience,
23. current expense per pupil,
24. ranked equalized grand list per Average Daily Membership,
25. maximum loss adjustment (state aid) per Average Daily Membership,
26. average grade taught,
27. average annual wage,
28. ranked average home price, and
29. 1992 effective tax rate.

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Fact Sheet

How Much are Teachers Paid?

Vermont Department of Education
School Finance

The Vermont Department of Education completed a census of school professional staff for the 1993-94 school year. It was done primarily to find out about the salaries of teachers, administrators and professional support staff. Salaries depend heavily on the education level and the number of years experience of the professional, and on which school district the professional works in.

Full Time Equivalent Salary for Teachers:

The amount professionals are paid, weighted by the full-time equivalency (FTEs), appears in the table below. By dividing pay by the corresponding FTE amount, one may estimate the equivalent pay if the person were working full time. The lowest and highest values are distorted by the inconsistencies in reporting FTEs and are not shown. The "5th Percentile" is that salary below which 5% of the FTEs will fall for that group.

	Administrators	Teachers	Support
5th Percentile	$34,308	$22,330	$22,683
Mean	$49,913	$34,555	$34,781
Median	$49,500	$34,686	$34,829
95th Percentile	$67,917	$47,580	$48,749
Full-Time Equivalents[1]	633	7,636	464

Mean FTE Pay	Administrators		Teachers		Support	
Degree	FTE Pay	FTEs	FTE Pay	FTEs	FTE Pay	FTEs
Certificate[2]	49,483	30	31,132	44	27,778	8
Bachelors	40,598	57	31,613	4087	30,385	135
Masters	50,307	452	38,030	3454	36,777	310
2nd Masters	51,421	37	36,693	35	35,764	6
Doctoral	55,577	56	40,560	16	39,024	5

Disparities in Salaries:

The numbers above do not show the variety of teacher salaries from region to region for given education levels and experience. If teachers with particular degrees and experience are considered, the variety of salaries appears. The table below relates to teachers with 6 through 10 years of experience:

	Bachelors	Masters
5th Percentile	24,365	26,530
Median	28,644	31,877
Mean	29,030	32,295
95th Percentile	35,314	40,046
FTEs	828	565

There is a great deal of variability in what a teacher would be paid for a given experience and education level in Vermont. For example, there are 114 full time teachers in Vermont who have a Masters degree and precisely 10 years of experience. 50% make $34,443 or more. 5% make $28,890 or less, while another 5% make $42,146 or more. This difference is larger than can be explained by differences in cost of living in different parts of Vermont. The number of added education credits explains less than 7% of this disparity.

1) The missing FTEs of two positions were imputed to be 1 each.
2) For administrators degree unknown, others associates or other degree.
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